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ABSTRACT

This description of career education activities in Coloma, Michigan, was prepared as part of a study conducted to identify evaluated, exemplary career education activities which represent the best of the current career education programs and practices referred to in Public Law 93-380. (See CE 018 212 for the final report of this study.) This document describes one of the ten projects that were selected from among 250 projects submitted. It presents one locale's way of successfully implementing a career education activity, the results of which are educationally significant. Each of the ten projects reported is described in terms of project overview; program development; materials and activities; parent and community involvement; staffing and management; costs; evidence of effectiveness; and conclusions. The ultimate goal of the Coloma Career Development Centered Curriculum (CDCC) project was to provide career development instruction to rural students at the elementary level. (This instruction is designed especially to increase students' awareness of life roles, to help them formulate realistic self concepts, and to foster the development and use of decision-making skills.) The primary subjects are identified as approximately 1,600 students in grades K-6, and the evaluation design is described as a pre- and posttest design using comparable groups of treatment and control students. (BM)

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PROJECT CDCC

Coloma Community School District

Coloma, Michigan

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American Institutes for Research

Lee Downey
Director, Project CDCC

30 June 1978

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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CE 018 317

FOREWORD

This activity description was prepared as part of a study conducted by the American Institutes for Research (AIR) under contract No. 300-77-0303 to the U.S. Office of Education. The purposes of the study were to identify evaluated, exemplary career education activities; to recommend identified activities to the Joint Dissemination Review Panel (JDRP) of the Education Division, Department of Health, Education, and Welfare; to prepare descriptions of identified activities; and to develop a handbook with six models for evaluating career education activities.

The criteria established for screening activities in this study intentionally limited choices to those whose evaluation reports presented evidence of effectiveness. Close attention was given to the soundness of evidence in evaluation reports. A minimum requirement for this evidence of effectiveness was that some comparison standard be provided so that gains made by the students participating in the activity could be attributed to the impact of the activity. After confidence in the evidence of effectiveness was established, further criteria were applied. These criteria included consistent relationships between a well-planned assessment of needs, a statement of desired student outcomes, the selection of instruments, and the procedures used in data collection, management, and analysis.

This document describes one of ten projects that was selected from among 250 submitted. It presents one locale's way of successfully implementing a career education activity, the results of which are educationally significant. Although the description reflects an activity developed in response to local needs, other school districts with similar needs may wish to adapt parts or all of it according to their own circumstances and philosophy.

We are especially grateful to the staff of Project CDCC and to the many school staff members who generously gave their time to answer questions from AIR site visitors. They extended a special kind of hospitality and spared no amount of effort to provide the information necessary to prepare this description. They made it possible for the site visitors to see the program in action, as well as to understand the philosophy and strategies that underlie its operations.

Project CDCC materials are judged to be free of bias with regard to race, sex, age, income levels, and type of occupation.

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PROJECT OVERVIEW

TITLE & LOCATION: Project CDCC (Career Development Centered Curriculum)
Coloma Community School Dsitrict
P.O. Box 218
Coloma, Michigan 49038

TYPE: Add-on via career education units

PROJECT DIRECTOR: Lee Downey
Ph: (616) 468-8341

SETTING: This project serves students in grades K-6. In 1975-76, the project was implemented in the district's three elementary schools. Coloma is a rural community in southwest Michigan. The estimated population in the area served is 12,000 persons, with 1,600 students enrolled in grades K-6 each year. A large segment of the parents is employed in business and industries related to agriculture. The project is currently being replicated at other locations throughout the state of Michigan under a statewide dissemination program funded by an ESEA Title IV-C Grant.

STAFF: During the four-year development and field testing period, Project CDCC staff consisted of a project director and two project coordinators. An evaluator was hired on a contract basis.

GOAL: The goal of Project CDCC is to provide career development instruction to rural students at the elementary level (K-6). This instruction is designed especially to increase students' awareness of life roles, to help them formulate realistic self concepts, and to foster the development and use of decision-making skills.

EVALUATION DESIGN: The impact of Project CDCC activities upon students was assessed in 1975-76 by testing comparable groups of treatment and control students at the beginning and again at the end of each instructional unit.

MATERIALS: The project has developed a comprehensive, articulated career development curriculum for K-6 students. The 27 units (four for each of grades K-5 and three at the sixth-grade level) include learning and practice in math, communication arts, science, and social studies; they also convey the career development aspects of an individual's growth. Teachers are also encouraged to use a few commercial materials.

COST: The main cost items are teachers' time spent in teacher training (a two-day inservice training session) and the Project CDCC units for each grade level.

PROJECT DESCRIPTION

The purpose of this section is to describe the origins of Project CDCC and its staff-developed instructional materials, the participation of the community, the management system, the costs of implementing the system, and the available evidence documenting its effectiveness.

PROGRAM DEVELOPMENT

Project CDCC was developed with ESEA Title III funds by the Coloma Community School District. Currently funded by the Michigan Department of Education's Experimental and Demonstration Centers Program, the project is designed to assist districts in meeting student career development needs.

Relation of the Activity to the Target Population

The Coloma Community School District is located in southwest Michigan. The estimated population in the geographic area is 12,000 persons, with 1,600 students enrolled in grades K-6 each year. A large segment of the parents is employed in businesses and industries related to agriculture. The community is comprised primarily of middle-class families. The school district is composed of the following ethnic groups: Native American -- 2%; Black -- .2%; Asian American -- .3%; Latin American -- 1.5%; White -- 96%.

Staff Survey

Coloma is an isolated, rural area in which students are not exposed to a wide range of occupations. Local student needs for an orientation to possible life roles and skills in decision making were identified using 1970-71 state assessment scores, locally-developed checklists of students' career awareness, and other local data. For example, teachers were surveyed and gave their opinions of student needs in different curriculum areas and in career and self awareness. Four local needs were identified on the basis of the state assessment scores and the teacher survey: (1) teachers needed a vehicle for making the curriculum relate to life activities and roles; (2) students were unaware of their own abilities, interests, and aptitudes; (3) students were unaware of the options available to them due to limited information and exposure; and (4) students needed to make better educational and occupational decisions.

Program Planning

The staff survey indicated that career awareness was of prime importance. The Coloma superintendent sensed that the community was ready for an innovative program, which caused him to set the stage to facilitate program development. He met with key teachers in the district to discuss career education needs and to plan appropriate strategies. It was decided that program planning should have input from parents, teachers, administrators, and students. In addition, two successful models of programs in career awareness were studied: Cobb County Schools' Career Education Program in Marietta, Georgia; and the Mesa, Arizona Public Schools project. Both of these model programs were visited by Coloma staff, and writings on career education by national educational leaders were studied. The following publication was consulted during the planning process: Occupational Choice: An Approach to a General Theory by Ginzberg. Writings by Havighurst, Super, and Tennyson were also used as references in the planning phase.

Project Goal

Based on the survey data and the planning process described above, the major project goal was set forth: to enhance the career development of elementary students by building specially developed curriculum units into the existing educational program. To measure the impact of these units on students, project staff developed objectives-referenced tests to be administered before and again after each unit was taught. A management system was developed to monitor project implementation and evaluation.

Measure of Achievement

An objectives-referenced approach was used as the general strategy for measuring attainment of objectives. During the first project year (1972-73), project staff struggled with the issue of developing a standardized test. It was felt that such a test would be so specific to the local area that it would not be applicable elsewhere. On the other hand, a more generalizable test would probably not measure what was being taught in the classroom. Another important factor was that staff felt they did not have the time to go through the norming procedure required for a standardized test. Therefore, the project evaluator, who was hired on a contract basis and was involved in the project from the beginning, encouraged staff to utilize an objective-referenced approach; the criterion adopted was that 75% of the students would demonstrate mastery of 75% of the objectives.

To translate the overall project objectives into student performance objectives that were measurable, project staff went through the following steps. First, a list of career development themes was derived from each project objective. Then, each of the themes was subdivided into goal statements for the various career development curriculum units. Finally, each unit goal statement was translated into one or more performance objectives. The result was a total of 141 performance objectives. Student accomplishment of these performance objectives indicated the degree to which each overall project objective was attained.

Before introducing any information about a unit, teachers pretested their students, studied the pretest results, and determined the areas in which students needed the most work by reviewing the unit's objectives. While teaching the unit, they used an observational checklist to record students' behavior. Teachers marked a form when students worked in small groups. Students continued working in small group activities until all students had an opportunity to meet the relevant performance objective.

After completing each capsule (unit subtopic), teachers decided whether or not students needed additional practice in the areas studied. After completing the unit, teachers did any necessary reviewing and included any indicated enrichment. The posttest was then administered. Students were assessed twice during each nine-week grading period (one pretest and posttest for each unit).

Source of Funding

During the 1971-72 school year a local committee representing parents, teachers, administrators, and students provided input for the original proposal that was written and submitted to obtain ESEA Title III funds. Funding began in July 1972.

MATERIALS AND ACTIVITIES

Selection of Unit Approach

Project CDCC staff did not want to present career development instruction in isolation from the existing elementary curriculum. However, a key decision was made early in the project to develop specific career education units that combined career information with academic skills. Project staff considered the unit approach after exposure to the Cobb County project. Their decision to develop units rather than to adopt a general infusion approach was motivated by three underlying assumptions.

First, units would have more staying power than general infusion techniques. Since units are discrete and concrete, they have a higher probability of teacher use and reuse, while teacher interest in infusion strategies may wane after the post-inservice training novelty has worn off.

Second, the effectiveness of units would be easier to evaluate than the effectiveness of diffuse infusion techniques. Perhaps more importantly, it is easier to attribute student gains to unit exposure than to exposure to infused career information. Teachers are more likely to continue using units when they can see that students are learning specific skills as a result of participating in the unit's learning activities.

Finally, units would be more attractive to teachers in adopting school districts. They comprise a neat package for dissemination and are easier for new teachers to review and assess than, for example, a handbook of general strategies for infusing career education concepts into the ongoing curriculum.

Having completed a staff survey and determined the project goal, and having selected the unit approach to implementing this goal, project staff and teachers in the Coloma Community Schools conducted an extensive literature search in order to derive the project objectives and the optimum unit content and format.

Project Design

To define the content of the units to be developed and implemented in grades K-6, project staff wrote the following three objectives.

Objective 1: Demonstrate an Increased Awareness of Life Roles. The varied careers that people may follow during their lives are the central focus of this objective. The following 12 career clusters are those addressed by the project. They resulted from a review of materials from the Cobb County, Georgia project and from the Mesa, Arizona public schools project, with several adaptations made by the Coloma project director:

- Natural resources
- Manufacturing
- Construction
- Technology and research
- Arts and entertainment
- Business, sales, trade, finance
- Clerical
- Transportation and communications
- Public service
- Personal and product service
- Hospitality and recreation
- Health

Objective 2: Formulate Realistic Self Concepts. A series of developmental tasks, which describe the sequential components of an individual's career development, emerged from the literature review conducted early in the project. They represent a synthesis of the various theoretical constructs exemplifying "healthy" career development. Following are examples of career development tasks that the project aims to help students accomplish:

Career Development Tasks

Grades	Developmental Period	Tasks
K-3	Fantasy	Children make unrealistic choices based on dreams and wishes.
4-6	Late Fantasy, Early Tentative	Children should be helped to see that there are still a number of years before career plans must be set.
7-9	Tentative	The individual begins to recognize the problem of career choice; decisions are tentative but more realistic.
10-12	Late Tentative, Realistic	The individual's considerations become much more practical as well as important. The individual's career hypothesis is reformed to make adjustments for changing interests, abilities, values, and increased knowledge of life roles.

Objective 3: Develop and Use Decision-Making Skills. Several sub-objectives were written to clarify the intent of this decision-making objective (similar sub-objectives were also written to clarify the intent of the first two objectives); they are displayed here.

- Sub-objective: The student will set personally relevant goals as part of his/her decision making.
- Sub-objective: The student will identify and use information about self and life roles as part of his/her decision making.
- Sub-objective: The student will understand decision making as identifying alternatives, selecting the alternative most consistent with goals, and taking steps to implement a course of action.

Achievement of this decision-making objective is viewed as laying the groundwork for students to be able to set and achieve individual educational and career goals.

Materials Development

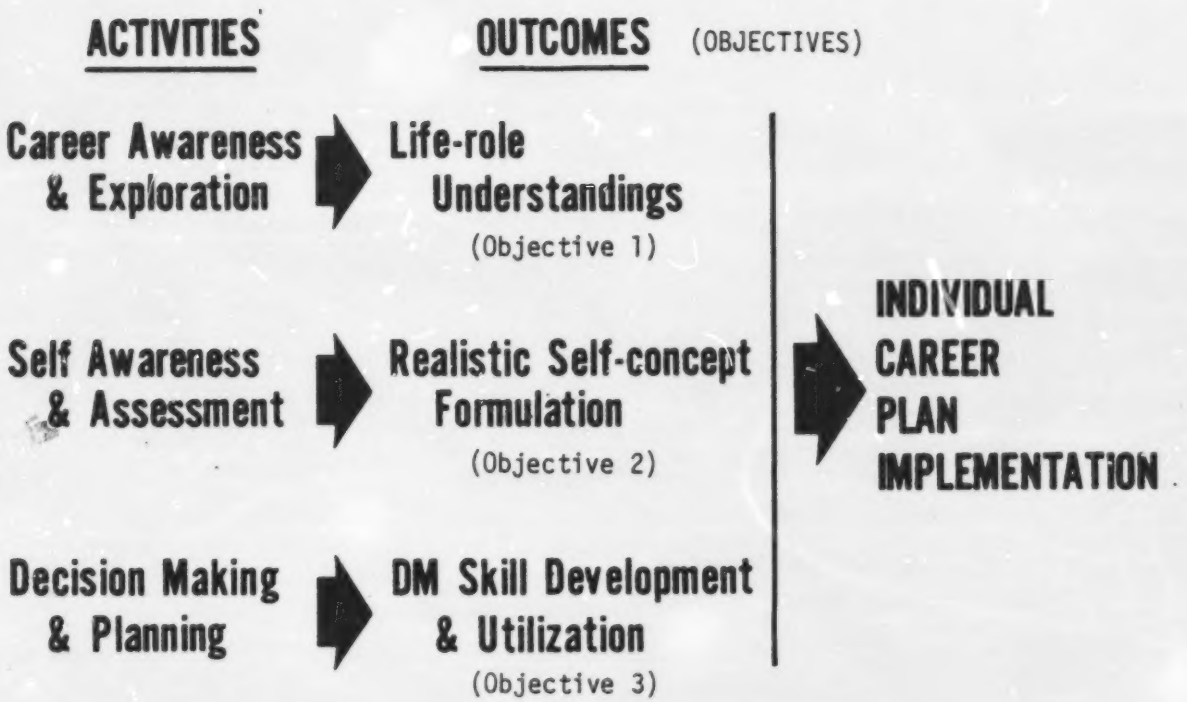
The materials development process consisted of combining occupational clusters, career development tasks, and career decision-making sub-objectives with the existing elementary curriculum to develop specific career education units. The career development tasks and academic skills, which become more sophisticated as students mature, defined the unit sequencing pattern. To develop units that would be feasible for teachers to implement, Coloma project staff and teachers followed a cyclic mode of developmental activities. Each year, over a period of three years, curriculum units were written, implemented in classrooms, evaluated, and revised.

In the first project year (1972-73), units were pilot-tested in approximately three classrooms per grade level in one school. The same teachers who developed those initial units on a voluntary basis implemented them in their classrooms. In 1973-74, the units were revised on the basis of the 1972-73 data and were field-tested in all classes in Coloma's three elementary schools. The units were again revised, on the basis of the 1973-74 results, and implemented in all three schools in 1974-75.

This continuous refinement process allowed modifications to be made in each unit each year. It also allowed the classroom teachers to have a large amount of input in the development and revision of the materials.

The methodology underlying the development of the units reflects the project's goal and objectives. Career education is viewed as nurturing the idea that education and subsequent involvement in a career can be more fulfilling if a student has gained the tools of career development -- i.e., the ability to maintain a realistic notion of who he or she is, of what particular traits and abilities make that person unique, and of how to assess and structure each life role for more rewarding consequences. The schematic on the next page illustrates the units' integrated approach to career education. K-6 learning activities are related to instructional outcomes that form a basis for the decisions students have to make during their junior and senior high school years.

CAREER DEVELOPMENT MODEL



Unit Format and Activities

Each teaching unit is composed of four sections. The first section identifies the unit's elements, themes, goals, and performance objectives. It also includes an evaluation approach or specific test items for determining the extent to which students accomplish the objectives. In the second section, the unit's teaching strategies are described and organized into unit subtopics or "capsules." This part also includes suggested resources to be used while teaching each capsule. The third section contains tips to help teachers implement particular learning activities. The fourth and final section contains student activity sheets to be duplicated in classroom quantities.

The units employ a variety of teaching strategies and techniques, including the use of activity sheets, classroom discussion, and audiovisual materials. Techniques that are particularly important for career development are presenting role models, role-playing/simulation, and field trips. The following examples illustrate what is done at different grade levels. At the kindergarten level, teachers bring resource people representing school workers and community helpers into their classrooms. First graders simulate a food store, in which students

can purchase items. In grade two, students role-play in conjunction with a bakery unit. Third-graders simulate a restaurant, in which students play the roles of hosts/hostesses and waiters/waitresses. A field trip is taken in conjunction with a forestry unit in fourth grade. Sixth-grade teachers bring in role models dressed to fit their occupations in transportation and the TV industry.

The following chart contains a list of unit titles by grade level, along with the self-awareness or occupational awareness areas that are addressed in each unit.

Career Development Curriculum Units for the Elementary Classroom		
	UNIT TITLE	FOCUS
K	ME	Self Awareness: Physical Self
	INSIDE ME	Self Awareness: Emotional Self
	SCHOOL WORKERS	Occupational Clusters: Public Service, Clerical
	COMMUNITY HELPERS	Occupational Clusters: Public Service, Natural Resources, Health
1	FRIENDSHIP	Self Awareness: Social Self
	A FEW OF OUR FAVORITE THINGS	Occupational Clusters: Arts, Technology, Research, Personal and Product Services
	TELEPHONE WORKERS	Occupational Clusters: Transportation and Communication
	THE FOOD STORE	Occupational Clusters: Business and Sales
2	MY ENVIRONMENT	Self Awareness: Environmental and Physical Self
	BAKING INDUSTRY	Occupational Clusters: Natural Resources, Manufacturing
	FIREFIGHTERS	Occupational Clusters: Public Service
	PET INDUSTRY	Occupational Clusters: Public Service, Personal and Product Services
3	DAIRY INDUSTRY	Occupational Clusters: Health, Manufacturing
	RESPONDING BEHAVIOR	Self Awareness: Emotional and Social Self
	RESTAURANT INDUSTRY	Occupational Clusters: Health, Hospitality, and Recreation
	AIRLINE WORKERS	Occupational Clusters: Health, Hospitality, Recreation, Clerical, Technology and Research
4	FORESTRY	Occupational Clusters: Natural Resources
	BEST FOOT FORWARD	Self Awareness: Self Appraisal, Goal Setting and Social Self
	POSTAL WORKERS	Occupational Clusters: Public Service
	POLICE WORKERS	Occupational Clusters: Clerical, Public Service
5	OUR GROUP AND ME	Self Awareness: Group Roles and Social Self
	MANUFACTURING	Occupational Clusters: Clerical, Business, Sales and Trades, Manufacturing
	HOSPITAL WORKERS	Occupational Clusters: Technology and Research, Clerical, Personal and Product Services, Health
	MY FEELINGS ARE ME	Self Awareness: Emotional Self
6	GOING ABROAD, ANYONE?	Occupational Clusters: Transportation and Communication, Hospitality and Recreation
	ME, MYSELF, AND I	Self Awareness: Physical, Emotional, Social and Intellectual Self
	T.V. INDUSTRY	Occupational Clusters: Business, Sales and Trades, Arts and Entertainment, Transportation and Communication, Technology and Research

Implementation Sequence

On the next page is the suggested schedule for implementing the full 27-unit sequence. A unit is studied for approximately two hours per day for a period of two to three weeks. As can be seen from the schedule on the next page, one unit is taught during each nine-week grading period.

The career education activities are completely integrated into the existing subject matter. For example, the Restaurant Industry unit includes the following subject areas and activities: health (categorizing food according to the four basic food groups), language arts (spelling, capitalization, and grammar), and math (adding, subtracting, dividing, and using graphs).

Key Materials and Equipment

The key materials for this project are the 27 curriculum units. Each unit is a teacher guide that contains master evaluation and activity sheets to be duplicated for each student. The units also have a "Resources and Materials" column that indicates what items are needed to conduct the learning activities within each capsule (unit subtopic). Suggested materials other than what is included within the unit are items less likely to be found in a typical school setting, inexpensive miscellaneous items, or items that could be brought from home. The resources and materials suggested for the Restaurant Industry are displayed in the following chart.

Restaurant Industry Unit
Materials and Resources

Silverware	Plastic cutlery	Tagboard
Paper plates	Construction paper	Menu
Plastic cups	Crayons	Scrap paper
Napkins	Pictures of food	Truck photos for schools (obtained from the American Trucking Association, Inc.)
Tables and chairs	Paints	
Play money	Hot plate/electric skillet	
Dish soap	Mop	
Scissors	Glue	Ingredients for preparing restaurant offerings
3" x 5" cards	Broom	
		Black magic markers

Teachers are encouraged to go beyond the curriculum guides to bring in other materials or to add any activities that meet the needs of their students. They are asked to use the note columns in the units to log changes, pitfalls to be avoided next time, questions, new ideas, things to be done differently in the

PROJECT CDCC UNIT SEQUENCE

	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Suggested Number of Teaching Techniques		
					RM	RP/S*	FT
K	Me	School Workers	Inside Me	Community Helpers	6	0	2
1	Friendship	A Few of Our Favorite Things[2]	Telephone Workers	The Food Store*	3	1	2
2	Firefighters	My Environment	Baking Industry*	Pet Industry	3	1	2
3	Dairy Industry	Responding Behavior	Restaurant Industry*	Airline Workers	3	1	2
4	Forestry Workers	Best Foot Forward	Postal Workers*	Police Workers	3	1	2
5	Our Group and Me[1]	Manufacturing*	Hospital Workers*	My Feelings Are Me	3	2	2
6	Going Abroad, Anyone?*	Me, Myself, and I	TV Industry*		2	2	2

[1]Implement early in school year

[2]May be implemented over three (3) quarters

RM - Role Models

RP/S* - Role Playing/Simulation

FT - Field Trips

future, etc. In this way the units are adapted to be more appropriate for the local setting. Since Coloma is located in a big fruit-growing area, some third-grade teachers supplement or replace dairy farming activities with information pertinent to the fruit-growing industry; they consider this a more appropriate occupational area for their students, since it is more tangible in their environment. A sixth-grade teacher uses a record to teach an ethics class in conjunction with a self-awareness unit; the record presents situations that make students more aware of their self-concepts and give them practice in decision making.

Reactions to Materials and Activities

In general, students looked forward to using the CDCC materials. They seemed to especially enjoy the self-awareness units. Teachers also reacted positively to the program, indicating they would recommend using the units to their colleagues. Teachers were asked to use a five-point rating scale (with five being the highest possible response) to answer the question: "To what degree would you recommend this unit to other teachers?" The mean response for 280 ratings was 4.2.

An unanticipated beneficial side effect of the program was that it helped teachers plan better in other academic areas. Through Project CDCC they were encouraged to look at what they had done -- to evaluate their work on the basis of student posttest performance to see the results of their teaching. They utilized this feedback to organize their future teaching.

PARENT AND COMMUNITY INVOLVEMENT

Project staff feel it is imperative that parents and community members be involved in the project so that students will become more aware of life roles. The CDCC curriculum units were structured to provide students with role playing experience, field trips, and interaction with community resource people. This affirmative posture toward parent and community involvement has been visible from the beginning of the career education movement in Coloma -- parents were members of the local committee that provided input for the original project proposal. During inservice training teachers are encouraged to build a background for the unit they will be presenting by visiting, observing, and talking with people working in the occupations addressed by the units.

Two specific activities are utilized to involve parents and the community in the project; these are the use of role models and field trips. For the role

model activity, a resource person (who could very well be a parent of one of the students) is contacted and asked to give a presentation to the class. If appropriate, the person is requested to bring the tools used in his or her role and to wear his or her work clothes or uniform. A typical presentation lasts 20-25 minutes.

Parents volunteer to go with students on field trips. In addition, when making arrangements for a field trip, teachers discuss with the site contact person workers with whom the students may talk and find out what kinds of hands-on experiences the students may have. Before the trip, a variety of learning materials and/or activities are used to enable students to capitalize upon what they see during the tour. Students compile a list of questions for which they seek answers during the field trip.

Parents are typically quite supportive of Project CDCC. The community displays a positive attitude toward work, and parents like the idea of having career education expose students to different occupations. They feel it is important to train students for careers while they are in school. There seems to be no negative community feeling about school expanding students' awareness and no resistance from parents who might want their children to follow the traditional occupational patterns of the area. Since Coloma residents are engaged in a limited number of occupations, the project has included information about other types of careers (although, as indicated above, materials are sometimes adapted to make them more relevant to the younger students).

STAFFING AND MANAGEMENT

Staffing

Project CDCC staff consisted of a project director and two project coordinators. An evaluator was hired on a contract basis. The functions of each of these key staff members are displayed in the chart on the next page.

The three major staff members devoted four years to the project, covering the development and field-testing period. Staff competencies were assessed by a validation team from the Michigan State Department of Education, which commended the Coloma School District for having attracted and held faculty members who were creative, dedicated, and enthusiastic.

	Staff Functions
Project Director	• Planning the project
	• Working with parents, teachers, administrators, and students in developing the proposal that resulted in project funding
	• Developing strategies to organize the district's support services and decision makers to facilitate and monitor the program
	• Obtaining project approval from the Board of Education
	• Obtaining commitment of central office and building administrators to the project's philosophy and methods, as demonstrated by resource allocations for materials, training, and field trips
	• Obtaining teacher commitment for training and project implementation
	* * *
Project Coordinators	• Facilitating project installation and maintenance
	• Conducting in-service training to help teachers implement the project curriculum units
	• Giving follow-up assistance so the units were used as intended
	• Occasionally spot-checking test administration during visits to schools
	• Double-checking test-scoring and routinely inspecting student answers for indications of possible bias in test administration
	• Supervising and organizing data tabulation
	• Maintaining a file of activity logs
	* * *
Evaluator	• Developing objective-referenced tests
	• Conducting data analyses

Management Strategies

The initial management thrust came from the superintendent, who was very committed to the project. For the three key staff positions he selected teachers within the system (for example, one of the project coordinators had been a

junior high science teacher). During the first project year the superintendent was instrumental in obtaining released time for key teachers to draft the units. In other words, the superintendent was an educational leader who tried to provide opportunities for motivated people to exercise their creativity.

Another important management theme dealt with how the units fared in the classroom. At early stages of the project, evaluation results showing the impact of units on students were used in the revision and improvement of curriculum materials. In addition to the data from objective-referenced tests and evaluation instruments, teacher logs and questionnaires provided feedback to the project for decision making and revision of procedures. Those wanting to adopt or adapt Project CDCC should be aware that while decisions were made at the district level by project staff, they were based on feedback from teachers who were implementing the units. The project director felt that there should be teacher involvement in the decision to implement the project rather than having that decision be made independently at the district level and then be transmitted down to local-level staff.

Inservice Training

The objectives of Project CDCC staff training are that each participant will: (1) increase his or her understanding of career development (self-awareness and career awareness) at the elementary level; (2) increase his or her understanding of Project CDCC and its conceptual framework; (3) understand the relationships and purposes of unit components -- i.e., objectives, the delivery system, and evaluation; (4) be prepared for using the teaching techniques included in the unit delivery system, e.g., field investigations and role-playing; (5) be prepared in planning for unit implementation; and (6) become familiar with evaluation data collection procedures. It is assumed that if staff achieve these six training goals, they will be more effective in implementing the CDCC units and thus will facilitate student achievement of the three major project objectives.

Staff development activities consist of a two-day training session; both large- and small-group training methods are utilized. During the first day teachers are briefed on the training schedule and goals. They are introduced to the concepts of career development and self awareness. They then engage in self awareness activities. During the afternoon they are introduced to the concept of career awareness and then participate in sessions concerning field trips and role playing/simulation.

During the second day teachers are briefed on the career education concept and career development. They are introduced to the CDCC program framework and

to the unit format. They learn about the teacher's role in program evaluation and how to use role models in the classroom. They then plan for unit implementation in grade-level groups.

Participants are requested to complete the form presented in Appendix A in order to assess the training program's effectiveness.

COSTS

Project CDCC received $440,395 in federal funds during the four-year development and pilot/field-testing period. These monies were from ESEA Title III funds. Costs for salaries included the project director and the two project coordinators. The school district contributed to the project by providing office space for the three project staff members as well as telephone use. The program served a total of 5,800 pupils during the four years for an average cost of $75.93 per pupil-year. This cost was computed by dividing the total project budget by the total number of student participants.

The table on the next page presents costs for project installation and for subsequent years. These costs indicate the expense involved in project adoption by other school districts.

EVIDENCE OF EFFECTIVENESS

Claims of Effectiveness

It is claimed that utilizing the CDCC curriculum will increase students' awareness of life roles, help students formulate realistic self-concepts, and help them develop and use decision-making skills.

Interpretability of Measures

There are 141 performance objectives across the 27 units. Tests of the attainment of these objectives are administered before and again after the unit is taught. The tests were developed by the teachers who designed the curriculum units and were revised over the three-year development period on the basis of pilot and field test results. The tests have high face validity in that they are closely related to the unit content.

Evidence of Impact

At the end of the third year of the project (1974-75), the decision was made jointly by the Coloma project and the Michigan Department of Education to

Approximate Costs for Adoption of Project CDCC*

INSTALLATION (Non-recurring Costs):	Staff Training (1 teacher)	$60-90	
	Curriculum Units	6	(Units at levels K-5 are $1.50 each; 6th grade units are $2.00 each.)
	Commercial Materials	0-20	(depending on LEA resources already available)
	TOTAL	$66-116	
YEARLY USAGE COSTS (Recurring Costs):	Miscellaneous materials and supplies	$ 9.60	
	Printing of activity/evaluation sheets for 24 students	$12.00	
	Field trips, two per year (Varies, depending on LEA transportation costs and field trips taken)		
	TOTAL	$21.60 +	cost of field trips

* Note: All cost figures are based on a unit of intervention that includes one teacher and 24 students.

seek a site where the effectiveness of the CDCC materials could be tested.

School personnel from Centreville, another town in southwest Michigan, had previously approached Project CDCC personnel to express their interest in beginning some organized career development activities of their own. Since Centreville resembled Coloma in important aspects (especially in having a strong agri-business base, in being a small, rural town, and in the ethnic, socio-economic, and cultural makeup of the community), Centreville was selected as the experimental* site.

The town of Mendon, located eight miles from Centreville, was contacted regarding its willingness to serve as a control site. The Mendon Community

* The term "experimental" is used in a non-technical sense to designate the site where program effectiveness was to be tested.

Schools agreed to act in this capacity, testing one classroom per grade level. The class selected for testing a particular unit was alternated among the two or three classes at each grade level to reduce the respondent burden for any given class at the control site.

During the 1975-76 school year, the Coloma Community Schools continued to use the curriculum materials in all K-6 classrooms in its three elementary schools, which were designated field test sites. With project staff serving as coordinators, the same materials were used at the same grade levels in the Centreville elementary school, the experimental site, in the same manner as they were used in Coloma. Mendon elementary students took the unit tests on a pre-post basis, serving as the control site. Centreville staff received three days of training during the week before school started; approximately three teachers per grade level participated in the group training. Mendon teachers were given an orientation to help them understand the evaluation design and to ensure their participation in such a manner as would maintain the design's validity.

Makeup and Comparability of Evaluation Samples. The five participating schools offered similar educational programs, had similar educational policies, and were alike in other relevant factors. The demographic data on the next page illustrate the comparability of the field test, experimental, and control sites.

Comparability of the three sites in terms of academic achievement can be determined by reviewing data from the Michigan Educational Assessment Program. This yearly statewide testing program includes objectives-referenced tests in reading and mathematics at the fourth-grade level. The data shown are scores from the fall 1974 testing for Centreville and Mendon and from the fall 1973 testing for Coloma (this seems to be the most appropriate comparison, since the CDCC units were introduced in Coloma during the 1973-74 school year).

Unit Tests. The CDCC units were evaluated using objectives-referenced, primarily paper-and-pencil (multiple choice) tests; observational checklists were used to assess achievement on some of the performance objectives. In all cases the tests were administered and checklists completed by the classroom teacher. Instructions to teachers on administering the unit evaluation were given in each unit; these called for the teacher to read the directions aloud, but all questions were to be read and responded to in writing by students themselves. Project staff mailed unit evaluations to the control school at various times throughout the year, corresponding to when the units were being taught and tests were being

Comparative Demographic Information

	Field Test Site (Coloma)	Experimental Site (Centreville)	Control Site (Mendon)
Location	Southwest Michigan	Southwest Michigan	Southwest Michigan
K-12 Enrollment	3,108	935	945
Number of Teachers	132	44	47
Number of Students per Teacher	24	21	20
State Equalized Valuation per Student	$18,836	$16,514	$20,223
Total Tax Mills	23.376	24.500	23.000
$ Spent per Child	$ 1,224	$ 1,292	$ 1,148
Curriculum Type	Traditional self-contained classroom with grouping for reading and math	Traditional self-contained classroom with grouping for reading and math	Traditional self-contained classroom with grouping for reading and math
Community Classification	Primarily middle-class rural	Primarily middle-class rural	Primarily middle-class rural
Occupational Orientation	Agribusiness and industry	Agribusiness and industry	Agribusiness and industry

State Assessment Results

Percentage of 4th-grade Students Attaining 75% or more of State Objectives

Coloma (N = 240)		Centreville (N = 80)		Mendon (N = 80)	
Reading	Math	Reading	Math	Reading	Math
35.2	63.6	46.4	69.6	41.8	70.1

administered at the treatment schools. Tests were administered in treatment and control schools at the same time. (This was verified by project coordinator visits to the control school.)

Credibility of Evidence

Aware that test results might be attributed to teacher bias in administering and scoring the tests, project staff introduced the following procedures to reduce that possibility. Procedures for administering unit evaluations were addressed during the inservice training. Follow-up assistance was given by the project coordinators, who occasionally spot-checked the administration of tests

during visits to schools. Experimental and field test teachers scored tests and recorded results for their own students; the project coordinators checked the scoring for these schools. Control test papers were scored by project personnel (control teachers had the evaluation sheets but not the performance objectives by which to score them). Student answers were routinely inspected for indications of possible bias in test administration. For example, if all students in a class answered an item or items identically, this was a signal that the teacher might have "taught to the test" or might have given excessive assistance during test administration. A validation team from the Michigan State Department of Education concluded that the data had been carefully collected and handled; all data calculations that were checked were confirmed to be correct. In all, there appears to be no reason to suspect biased test administration and no doubt as to the accuracy of the data tabulation and analysis.

Whenever possible, all students were pre- and posttested. However, for some of the test items it was not practical to collect pretest measures. For example, this was one of the performance objectives for the kindergarten unit entitled Inside Me, which focuses on self-awareness: "The student will demonstrate an awareness of the feelings found in himself/herself, as measured by the completion of a 'feelings' booklet." This objective was not pretested since it was unlikely that students would be able to achieve the objective prior to instruction.

There were substantial differences in posttest performance between experimental and control groups in favor of the former; to substantiate this impression, statistical analyses were computed by AIR. For every objective, chi-squares have been calculated between the Mendon control group and the Centreville experimental group. A separate chi-square was computed for the pretest and posttest results on each objective. The intent was to ascertain the number of cases in which a nonsignificant difference on the pretest was coupled with a significant difference on the posttest in favor of the Centreville experimental group.

As stated above, there were 141 performance objectives for the entire K-6 program. Of these, 83 had pretest and posttest data from Centreville and Mendon; 24 had posttest data only. The remaining 34 objectives had no data from the Mendon control group. These objectives were so specific to the unit content that there was no point in testing them at the control school. For example, the previously cited performance objective for the kindergarten unit Inside Me was not tested at Mendon; it did not seem justifiable to ask students to make a "feelings" booklet without receiving the accompanying instruction. The table on

the next page presents a graphic display of the performance differences among students at the three sites. A table in the appendix presents the chi-squares and significance levels for differences in objective attainment between the experimental and control groups, as measured by the objective-referenced tests. In this table, the last digit of each objective number represents the major project objective to which the performance objective is related. In this manner the reader can see how many performance objectives are related to each project objective and how successful the materials were in effecting achievement of each of the three project objectives.

As these tables show, there were significant posttest differences in favor of the experimental group over the control group. Furthermore, these data are evidence that the project was successful in achieving all three of its major objectives (at least 74% of the objectives related to increased awareness of life roles, formulating realistic self-concepts, and developing decision-making skills revealed substantial differences in posttest performance in favor of the experimental group).

Evidence That Effects Are Attributable to the Intervention

Seventy-seven teachers taught the units in Centreville and Coloma. The fact that differences in objective achievement were obtained over a large number of teachers rules out teacher effects as the probable cause of differences. Use of a comparable control group offers assurance that neither maturation nor selection of a superior treatment group are causal factors. Rather, it can be inferred that the differential objective achievement is attributable to the learning experiences provided by the CDCC project.

Evidence That Effects Are Educationally Meaningful

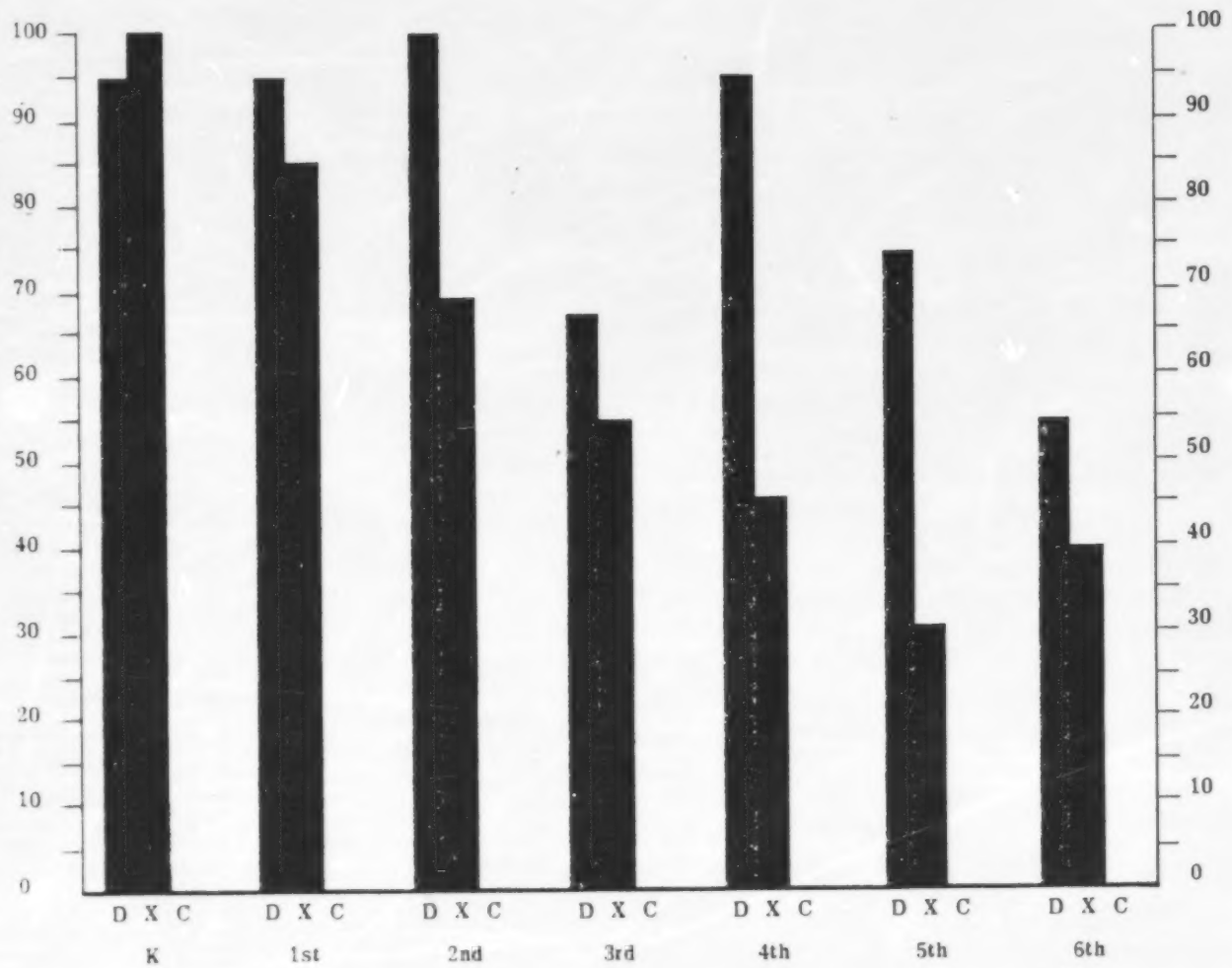
The educational significance of Project CDCC must be judged on: (1) the importance of its objectives, (2) the fact that success in achieving these objectives was demonstrated over a one-year period and even greater success was shown in four years, (3) the cost of implementing the program, and (4) the relationship of successful results in career education to other types of results. Regarding the last point, some educators have expressed fear that time devoted to career education will be subtracted from time spent on teaching basic academic skills, causing lower results on achievement tests. The question of whether Project CDCC's activities had a positive or negative effect on academic achievement can be partially answered, at least, by reviewing data from the Michigan

EVALUATION DATA

1975-76 ELEMENTARY

KEY:

D developmental site
X experimental site
C control site



Percentage of CDCC Program Objectives attained by 80% or more of the students

Educational Assessment program collected prior to and following CDCC implementation. Results from the statewide assessment program are given in the appendix for Coloma (Fall '73 = pre-intervention; Fall '74 = post), and for Centreville and Mendon (Fall '75 = pre-intervention; Fall '76 = post).

These results show that the percentage of students achieving state assessment objectives increased by a much larger amount for Coloma fourth-grade students than for the state as a whole. The percentage increase in math was three times the statewide increase, while the reading increase was two and one-half times as great. In both subject areas Coloma students advanced from scores below the statewide average to scores above the state average. Coloma seventh-graders also showed greater gains in reading and math than those for the state as a whole.

After one year of exposure to the CDCC units, the same sort of result was obtained for Centreville fourth-grade students as had been found earlier at Coloma; i.e., the percentage of students achieving state assessment objectives increased by a larger amount (in math, by a much larger amount) for Centreville students than for the state as a whole. The Mendon students, who were not exposed to the units, showed a smaller achievement increase in math, although they achieved slightly more in reading. During the one-year interval from Fall '75 to Fall '76, there was a general decline in seventh-grade achievement throughout the state. After exposure to the CDCC units, Centreville students' scores declined by a smaller amount than statewide scores or those of Mendon students. As in the '73-74 results, a greater gain was found in reading. While statewide and Mendon scores declined, Centreville students increased their achievement, and Coloma students increased by an even larger amount (note that part of this cohort, which was in the sixth grade during the 1975-76 school year, had been exposed to CDCC materials for four years). The Coloma students advanced from ranking below the statewide reading average to above-average status; Centreville students maintained their above-average rank, while Mendon students dropped below the state average.

In summary, though these data do not prove that Project CDCC <u>improves</u> students' academic skills (because no attempt was made to match the schools on types of academic programs offered), they appear to lay to rest the fear that implementing career education activities will <u>hurt</u> academic achievement.

<u>Evidence of Generalizability to Other Populations</u>

Project CDCC has been awarded an ESEA Title IV-C grant within the state of Michigan to provide training and materials for successful program adoption/adap-

tation. It is currently being replicated at other locations throughout the state. Its positive results in Centreville as well as its successful operation in Coloma over a period of four years provide a strong indication that the project will be generalizable to other similar communities and school populations.

Favorable Review by Joint Dissemination Review Panel

The Joint Dissemination Review Panel (JDRP) was established by the Education Division of the Department of Health, Education, and Welfare in 1972. The joint U.S. Office of Education - National Institute of Education (NIE) Panel currently has 22 members, eleven from each agency, appointed respectively by the Commissioner of Education and the Director of NIE. The JDRP meets periodically to review the evidence of effectiveness submitted for a wide variety of federally supported educational products and practices, with effectiveness being the sole criterion for approval by the JDRP. It is charged with the responsibility of ensuring that educational interventions - projects, products, or practices - have been shown to have positive impacts on thejr recipients before they are disseminated with federal funds or endorsed by the Education Division.[1]

In March 1978, the JDRP reviewed Project CDCC and approved it for nationwide dissemination. However, several caveats were recorded. The Panel suggested that statistical tests other than chi-square tests (such as Analysis of Variance or t-tests) might have dealt better with the instances in which treatment or comparison classes were comprised of small numbers of student. In addition, a statistical analysis of the differences between the reading scores of treatment and comparison school students would have determined whether or not those differences were at least partly accountable for the between-school differences in student performance on the unit tests. This information is provided so that those school districts interested in adopting Project CDCC have the advantage of the Panel's suggestions.

[1] Tallmadge, G.K. The Joint Dissemination Review Panel: IDEABOOK. Washington, D.C.: NIE/DHEW, September 1977.

CONCLUSION

In an isolated, rural area in which students are not exposed to a wide range of occupations, Project CDCC developed and field tested specific career education units that combined a great deal of information on occupations with academic skill training. Not only were these units designed to increase students' awareness of occupational roles, but also to help them formulate realistic self concepts and develop their decision-making skills. The results of the 1975-76 evaluation of the units' impact on students indicated that Project CDCC developed units were largely effective in achieving their intended purposes. Thus, school districts with similar student needs and instructional goals have the advantage of being able to consider adapting Project CDCC to their local settings.

PROJECT CDCC TRAINING EVALUATION FORM

Each participant will:	Accomplishment Low Degree				High Degree
1. increase his/her understanding of career development at the elementary level (self awareness and career awareness).	☐	☐	☐	☐	☐
2. increase his/her understanding of Project CDCC and its conceptual framework.	☐	☐	☐	☐	☐
3. understand the relationships and purposes of unit components -- i.e., goals, objectives, delivery system, and evaluation.	☐	☐	☐	☐	☐
4. be prepared for using the teaching techniques included in the unit delivery systems -- e.g., field investigations, role playing.	☐	☐	☐	☐	☐
5. be prepared in planning for unit implementation.	☐	☐	☐	☐	☐
6. become familiar with evaluation data collection procedures.	☐	☐	☐	☐	☐

7. On what parts of the workshop, if any, was too much time spent? _____

_____

8. On what parts of the workshop, if any, was too little time spent? _____

_____

9. On what parts of the workshop was the proper amount of time spent? _____

_____

10. Which topics, if any, needed more clarification? _____

_____

11. Were there any necessary topics or activities that you feel were omitted from the workshop? _____

_____

12. What parts of the workshop, in your opinion, were most meaningful? _____

_____

13. What parts of the workshop, in your opinion, were least meaningful? _____

_____

14. Please make any comments (positive, negative, or both) regarding your reactions to the workshop on the back of this sheet.

Appendix B

OBJECTIVE-REFERENCED TEST RESULTS

Objective*	N Pre	N Post	% Achieving Obj. Pre	% Achieving Obj. Post	X^2 Pre	X^2 Post
1.12 Exp	71	67	15%	99%	.008	55.902**
Con	29	28	14%	25%		
1.22 Exp		66		100%		44.905**
Con		28		32%		
2.12 Exp		73		100%		18.903**
Con		28		71%		
2.22 Exp		73		100%		13.017**
Con		28		79%		
2.32 Exp		65		94%		18.639**
Con		28		54%		
2.42 Exp		70		100%		70.629**
Con		28		18%		
3.11 Exp	68	71	44%	97%	12.038**	72.77**
Con	26	29	4%	10%		
3.21 Exp	68	71	7%	94%	22.409**	25.504**
Con	26	29	54%	48%		
4.11 Exp	62	68	76%	100%	5.351**	24.353**
Con	27	27	48%	63%		
4.21 Exp	64	68	66%	100%	.000	9.837**
Con	27	27	63%	81%		
5.11 Exp	80	77	9%	73%	.003	33.12**
Con	26	28	8%	7%		
5.23 Exp		77		100%		90.112**
Con		28		7%		
5.32 Exp		77		100%		19.928**
Con		28		71%		
6.11 Exp	76	77	50%	90%	.084	11.935**
Con	25	25	56%	56%		
6.21 Exp	76	77	62%	77%	1.098	.249
Con	25	25	76%	84%		
6.31 Exp	76	78	55%	97%	2.570	12.336**
Con	25	25	77%	72%		
6.41 Exp	76	78	84%	95%	1.123	1.790
Con	25	25	72%	84%		
7.11 Exp	79	75	58%	92%	1.54	18.337**
Con	18	19	67%	47%		
7.21 Exp	79	74	53%	82%	.006	5.875**
Con	18	19	56%	53%		
7.31 Exp	79	75	61%	98%	.019	15.971**
Con	18	19	56%	68%		
8.12 Exp		42		100%		7.439**
Con		22		77%		
8.22 Exp		42		100%		7.439**
Con		22		77%		
8.32 Exp		42		100%		47.533**
Con		22		14%		
8.42 Exp		41		100%		5.195**
Con		22		82%		
8.52 Exp		42		100%		16.751**
Con		22		59%		
9.11 Exp	51	59	51%	97%	.564	11.744**
Con	20	24	55%	67%		
9.21 Exp	51	59	25%	83%	2.625	20.180**
Con	20	24	5%	29%		
9.31 Exp	51	59	65%	90%	7.578**	29.386**
Con	20	24	24%	29%		
9.41 Exp	51	59	41%	53%	.000	.097
Con	20	24	45%	46%		
10.11 Exp	44	44	91%	100%	.283	5.621**
Con	24	22	83%	82%		
10.21 Exp	44	44	45%	70%	4.445**	.417
Con	24	22	17%	59%		
10.31 Exp	44	44	89%	95%	.483	.033
Con	24	22	79%	91%		
10.41 Exp	44	44	25%	68%	5.432**	26.582**
Con	24	24	0%	0%		
11.11 Exp	57	57	65%	95%	.921	.157
Con	22	23	50%	96%		
11.21 Exp	57	56	60%	96%	.195	14.361**
Con	22	23	68%	61%		
11.31 Exp	57	56	88%	95%	.000	.143
Con	22	23	91%	96%		
12.11 Exp	63	64	70%	84%	1.539	24.539**
Con	22	21	86%	24%		
12.21 Exp	63	64	48%	63%	.442	6.027**
Con	22	21	36%	29%		
12.31 Exp	60	64	40%	95%	1.413	2.623
Con	22	21	23%	81%		
12.41 Exp	60	64	25%	58%	.097	.005
Con	22	21	32%	62%		
13.13 Exp		56		82%		10.300**
Con		25		44%		
13.23 Exp		56		80%		18.399**
Con		25		23%		
13.32 Exp		52		100%		3.683
Con		25		88%		
13.42 Exp		52		100%		3.683
Con		25		88%		
13.52 Exp		52		100%		1.694
Con		25		92%		
13.62 Exp		52		98%		.437
Con		25		92%		
14.11 Exp	65	66	8%	26%	.540	2.340
Con	20	20	0%	5%		
14.21 Exp	65	67	14%	55%	.056	1.776
Con	20	20	15%	35%		
14.31 Exp	65	66	34%	97%	1.787	55.249**
Con	20	20	15%	15%		
14.41 Exp	65	67	26%	54%	.035	1.908
Con	20	21	25%	33%		
14.51 Exp	65	66	17%	38%	.944	.013
Con	20	21	5%	33%		
15.11 Exp	54	53	48%	58%	.196	.322
Con	21	19	57%	47%		
15.21 Exp	54	53	28%	36%	.145	1.963
Con	20	19	20%	58%		
15.31 Exp	55	53	9%	30%	.761	.031
Con	20	19	0%	32%		
16.11 Exp	64	61	30%	85%	.003	24.999**
Con	23	21	26%	24%		
16.21 Exp	64	61	23%	74%	2.935	7.207**
Con	23	21	4%	38%		
16.31 Exp	64	61	9%	49%	.069	11.288**
Con	22	21	5%	5%		
16.41 Exp	64	62	56%	97%	4.403**	14.859**
Con	22	21	27%	62%		

Objective*		N Pre	N Post	% Achieving Obj. Pre	% Achieving Obj. Post	χ^2 Pre	χ^2 Post
16.52	Exp		61		98%		.316
	Con		21		100%		
17.13	Exp		45		96%		.044
	Con		21		100%		
17.23	Exp		45		93%		.333
	Con		21		100%		
17.33	Exp		45		64%		4.405**
	Con		21		33%		
17.43	Exp		45		91%		21.273**
	Con		21		33%		
18.11	Exp	60	63	48%	73%	.044	13.991**
	Con	19	21	42%	24%		
18.21	Exp	60	63	38%	63%	3.365	13.365**
	Con	19	21	21%	14%		
18.31	Exp	59	63	71%	86%	.004	2.573
	Con	19	21	68%	67%		
18.41	Exp	59	63	59%	76%	1.096	1.944
	Con	19	21	42%	57%		
18.51	Exp	59	63	42%	71%	.061	4.424**
	Con	19	21	42%	48%		
18.61	Exp	59	63	8%	54%	.001	8.517**
	Con	19	21	5%	14%		
18.71	Exp	60	63	55%	92%	1.060	2.420
	Con	19	21	68%	76%		
19.11	Exp	50	52	26%	40%	.144	.471
	Con	24	24	33%	29%		
19.21	Exp	50	52	52%	69%	7.353**	1.035
	Con	24	24	88%	83%		
19.31	Exp	50	52	52%	94%	6.827**	2.923
	Con	23	24	87%	75%		
19.41	Exp	50	52	74%	88%	2.076	1.229
	Con	24	23	54%	48%		
20.12	Exp	70	69	77%	97%	4.457**	22.673**
	Con	25	11	52%	45%		
20.22	Exp		69		72%		4.111**
	Con		11		36%		
20.32	Exp	70	68	53%	97%	6.785**	24.247**
	Con	25	28	20%	54%		
20.42	Exp	70	68	24%	66%	.750	4.846**
	Con	25	28	36%	39%		
21.11	Exp	54	53	48%	85%	4.466**	11.179**
	Con	28	26	21%	46%		
21.21	Exp	54	53	89%	96%	.004	.040
	Con	28	26	86%	92%		
21.31	Exp	54	53	9%	55%	.240	11.762**
	Con	28	26	4%	12%		
21.41	Exp	54	53	0%	23%	---	5.756**
	Con	28	28	0%	0%		
21.51	Exp	54	53	22%	68%	3.511	26.248**
	Con	28	26	4%	4%		
22.11	Exp	66	70	58%	61%	2.571	7.314**
	Con	25	23	36%	26%		
22.21	Exp	66	70	17%	70%	.025	7.626**
	Con	28	23	18%	35%		
22.31	Exp	66	70	23%	33%	.424	1.329
	Con	28	23	14%	17%		
22.41	Exp	66	70	58%	70%	.058	10.736**
	Con	25	24	52%	29%		
22.51	Exp	66	70	30%	61%	.063	14.335**
	Con	23	23	30%	13%		
23.13	Exp	49	51	27%	49%	3.159	.025
	Con	26	26	50%	54%		
23.22	Exp	49	51	16%	27%	1.222	5.510**
	Con	24	21	4%	0%		
24.11	Exp	67	65	4%	83%	.128	46.013**
	Con	23	23	0%	0%		
24.21	Exp	67	65	4%	88%	.128	48.876**
	Con	23	23	0%	4%		
24.33	Exp	67	65	19%	68%	.747	15.367**
	Con	23	23	9%	17%		
24.42	Exp	67	65	15%	48%	.014	5.308**
	Con	23	23	13%	17%		
25.12	Exp	66	63	15%	17%	.128	.199
	Con	22	20	9%	10%		
25.22	Exp	66	63	0%	70%	---	26.989**
	Con	22	20	0%	0%		
25.32	Exp	67	63	0%	84%	---	42.976**
	Con	22	20	0%	0%		
25.42	Exp	64	63	31%	49%	.319	.037
	Con	22	20	41%	50%		
26.11	Exp	62	66	47%	64%	.191	1.362
	Con	21	19	38%	47%		
26.21	Exp	62	66	3%	17%	.122	.903
	Con	21	20	5%	5%		
26.31	Exp	62	66	2%	55%	.362	16.589**
	Con	21	20	0%	0%		
26.41	Exp	62	65	42%	52%	11.941**	.549
	Con	23	20	87%	65%		
25.51	Exp	62	65	56%	89%	19.803**	52.140**
	Con	23	20	0%	0%		
26.61	Exp	65	65	15%	48%	2.311	5.516**
	Con	21	20	0%	15%		
26.71	Exp	65	65	77%	86%	.047	3.201
	Con	21	20	71%	65%		
26.81	Exp	62	65	45%	57%	1.153	1.187
	Con	21	18	62%	39%		
26.91	Exp	62	66	5%	29%	.330	3.324
	Con	21	19	5%	5%		

*Objectives are coded by unit; for example, Objective 1.12 is a performance objective for the first unit in the series, Me. Within that unit, it is the first objective for which there are data from both Centreville and Mendon. The last digit (2) indicates that it relates to the second major project objective--formulating a realistic self-concept. (One first-grade unit, Friendship, was omitted from the table, as no data were collected from Mendon for any of the objectives.)

**$p < .05$ if $\chi^2 \geq 3.841$, df 1

Note: Variation in N from pre- to posttest is primarily due to student attendance on the days tests were given; teachers were not required to give makeup tests.

Exp = Centreville students Con = Mendon students

Appendix C

State Assessment Results

Percentage of students attaining 75% or more of objectives

	4th Math			4th Reading			7th Math				7th Reading			
Fall	Coloma		State	Coloma		State	Coloma		State		Coloma		State	
73 (Pre)	63.6		67.0	35.2		38.5	39.2		43.1		41.2		50.0	
74(Post)	85.3		74.1	60.8		48.6	44.4		47.6		52.6		55.3	
	Ce	M	S	Ce	M	S	Ce	M	Co	S	Ce	M	Co	S
75 (Pre)	72.3	74.6	78.7	46.2	49.2	52.5	68.9	50.0	60.0	56.5	59.5	57.7	54.3	57.4
76(Post)	88.7	83.9	80.0	52.1	56.5	56.4	66.7	43.3	50.9	53.8	62.3	55.2	58.1	56.4

KEY: Ce = Centreville M = Mendon Co = Coloma S = State

Following is a summary of the gain between '73 and '74 testing for Coloma and the state as a whole:

4th Math		4th Reading		7th Math		7th Reading	
Coloma	State	Coloma	State	Coloma	State	Coloma	State
21.7%	7.1%	25.6%	10.1%	5.2%	4.5%	11.4%	5.3%

Following is a summary of the gain between '75 and '76 testing for Centreville, Mendon, and Coloma (at the seventh-grade level only), compared to the state as a whole:

4th Math			4th Reading			7th Math				7th Reading			
Ce	M	S	Ce	M	S	Ce	M	Co	S	Ce	M	Co	S
16.4%	9.3%	1.3%	5.9%	7.3%	3.9%	-2.2%	-6.7%	-9.1%	-2.7%	2.8%	-2.5%	3.8%	-1.0%